# Cancer Therapies

## Cyclophosphamide
**Brand Names:** Cytoxan, Neosar  
**What it is:** chemotherapy drug  
**How it works:** Cyclophosphamide acts by transferring one or more saturated carbon atoms to cellular macromolecules. This damages the cancer cell DNA, and slows or stops the growth of the cancer cells.  
**Do not use if one or more is true:** ABC-B2 = +  
GSTP1 = +  
MT1 = +  
**Safe to use for:** Patient 1 yes no  
Patient 2 yes no

## Doxorubicin
**Brand Names:** Adriamycin, Rubex  
**What it is:** chemotherapy drug  
**How it works:** Doxorubicin inhibits RNA synthesis and causes DNA strand breakage. This slows or stops the growth of the cancer cells.  
**Do not use if one or more is true:** EGFR = +  
ABC-C6 = +  
**Safe to use for:** Patient 1 yes no  
Patient 2 yes no

## Fluorouracil (5-FU)
**Brand Name:** Adrucil  
**What it is:** chemotherapy drug  
**How it works:** Fluorouracil binds with and deactivates a key enzyme (thymidylate synthetase) in thymidine biosynthesis. This slows or stops the growth of the cancer cells.  
**Do not use if one or more is true:** EGFR = +  
BCL2 = +  
DPYD = +  
**Safe to use for:** Patient 1 yes no  
Patient 2 yes no

## Methotrexate
**Brand Names:** Mexate, Folex  
**What it is:** chemotherapy drug  
**How it works:** Methotrexate binds to and inactivates the enzyme dihydrofolate reductase (DHFR), and inhibits the synthesis of purine and pyrimidine. This prevents the growth of cancer cells.  
**Do not use if one or more is true:** BCL2 = +  
DHFR = +  
**Safe to use for:** Patient 1 yes no  
Patient 2 yes no

## Paclitaxel
**Brand Name:** Taxol  
**What it is:** chemotherapy drug  
**How it works:** Paclitaxel binds to tubulin and blocks cell division. This slows or stops the growth of cancer cells.  
**Do not use if one or more is true:** BCL2 = +  
ERB-B2 = +  
**Safe to use for:** Patient 1 yes no  
Patient 2 yes no

## Tamoxifen
**Brand Name:** Nolvadex  
**What it is:** hormone (antiestrogen)  
**How it works:** Tamoxifen binds to the estrogen receptor, preventing cell growth. It also affects the cycling of the cell in the natural cell cycle.  
**Do not use if one or more is true:** ESR1 = 0 or –  
ERB-B2 = +  
**Safe to use for:** Patient 1 yes no  
Patient 2 yes no

## Trastuzumab
**Brand Name:** Herceptin  
**What it is:** monoclonal antibody  
**How it works:** Herceptin binds to the ERB-B2 growth factor receptor and prevents the cell from dividing.  
**Do not use if one or more is true:** ERB-B2 = 0 or –  
**Safe to use for:** Patient 1 yes no  
Patient 2 yes no

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